



UNITED STATES DEPARTMENT OF ENERGY

## OFFICE OF RIVER PROTECTION

# Hanford Advisory Board Annual Agency Update

Kevin Smith, Manager

Wednesday, November 5, 2014



# Our Priorities

## Our Mission

To safeguard the nuclear waste stored in Hanford's 177 underground tanks, and to manage the waste safely and responsibly until it can be treated and properly dispositioned.

## Our Goal

To be a high performing organization that is the best in the Department of Energy's nuclear defense complex.

## Tank Farms Operations



## Waste Treatment and Immobilization Plant

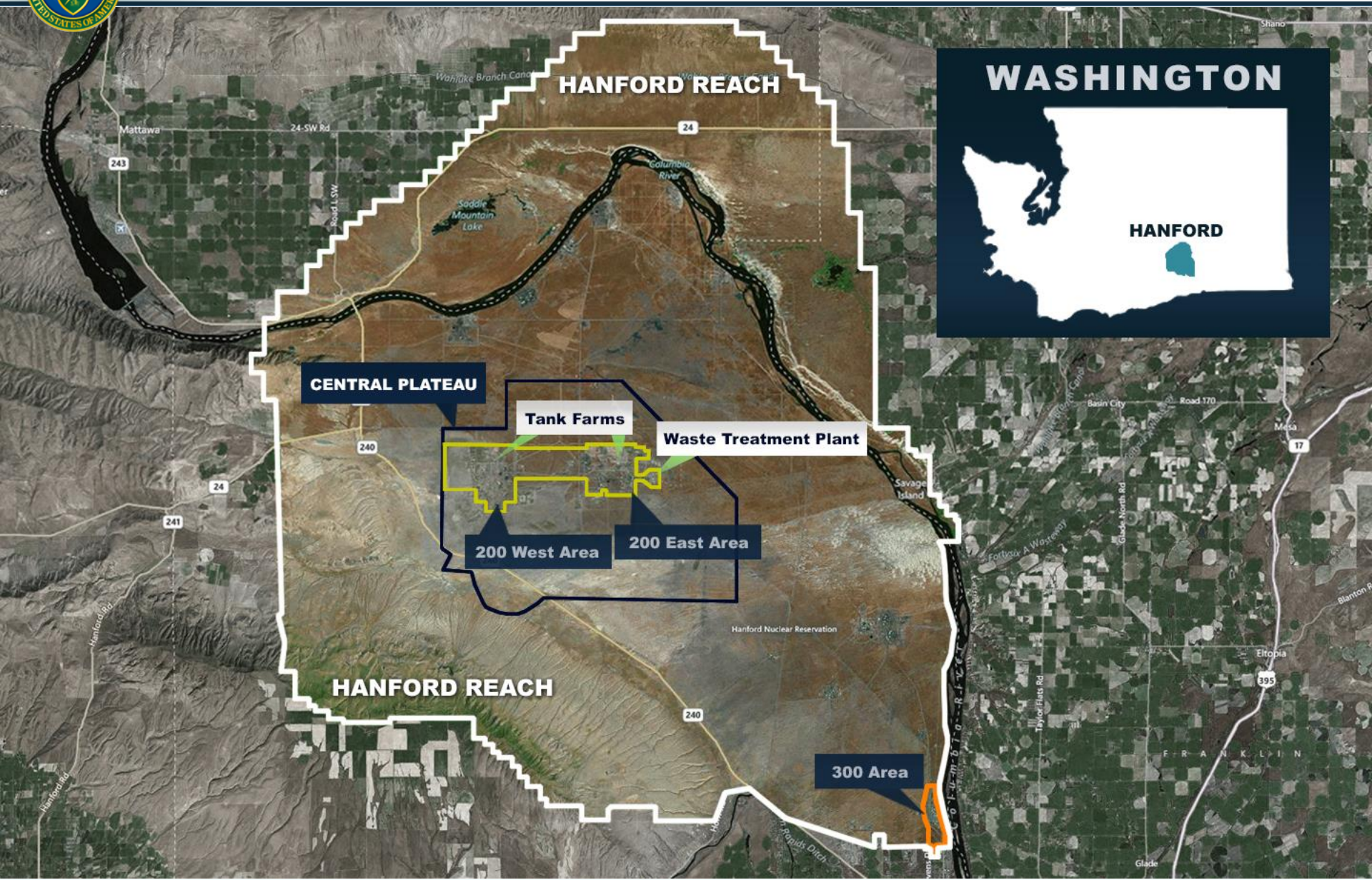






UNITED STATES DEPARTMENT OF ENERGY

# OFFICE OF RIVER PROTECTION



## WASHINGTON

HANFORD

CENTRAL PLATEAU

Tank Farms

Waste Treatment Plant

200 West Area

200 East Area

HANFORD REACH

300 Area



**Environmental Management**

safety ♦ performance ♦ cleanup ♦ closure





# Areas of Responsibility

## *The Tank Farms* A 200 Area Aerial Overview

200 West Area

200 East Area

Waste Treatment and  
Immobilization Plant

SX S

U

TX TY T

SY

BX

BY

B

C

AW

A

AY

AX

AZ

AN

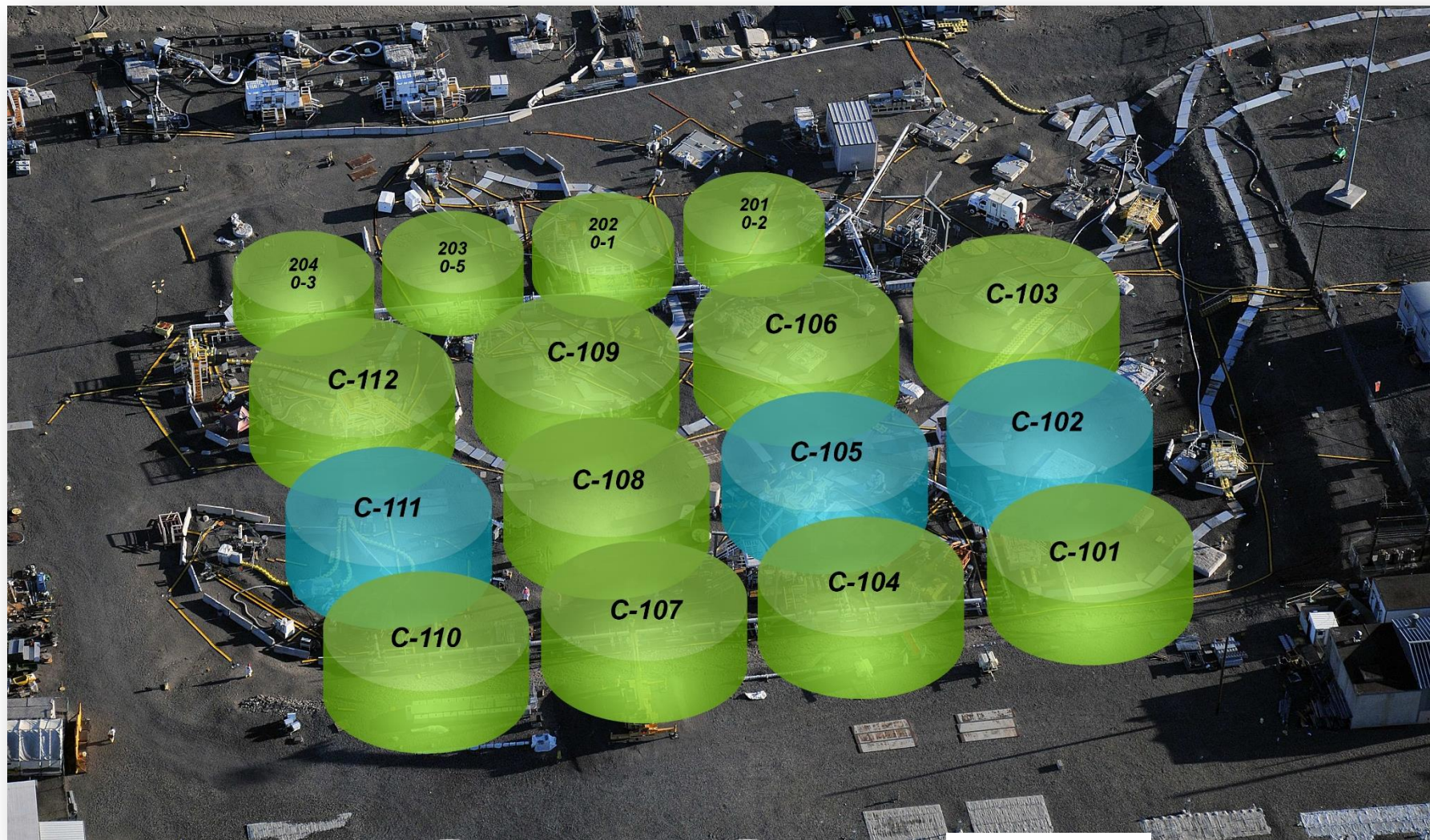
AP

Single-Shell Tank Farm  
Double-Shell Tank Farm





# C-Farm Retrieval Status



Retrieved



Retrieval

Ongoing





## Tank Farm Progress – Single-Shell Tank C-101







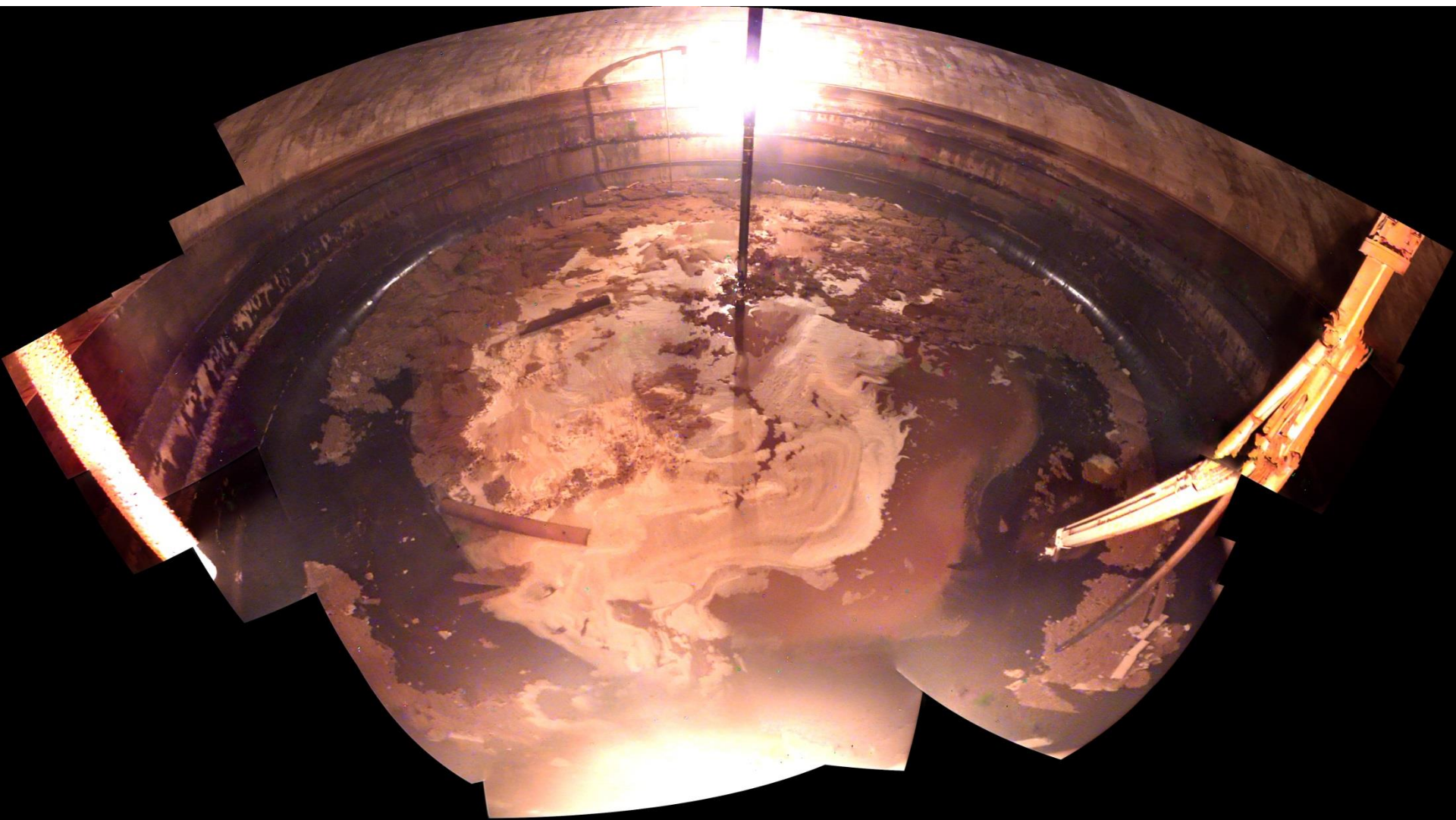
# Tank Farm Progress – Single-Shell Tank C-107







# Tank Farm Progress – Single-Shell Tank C-112







## Tank Farm Challenges – Single-Shell Tank C-102



Obstruction near the C-102 Pump

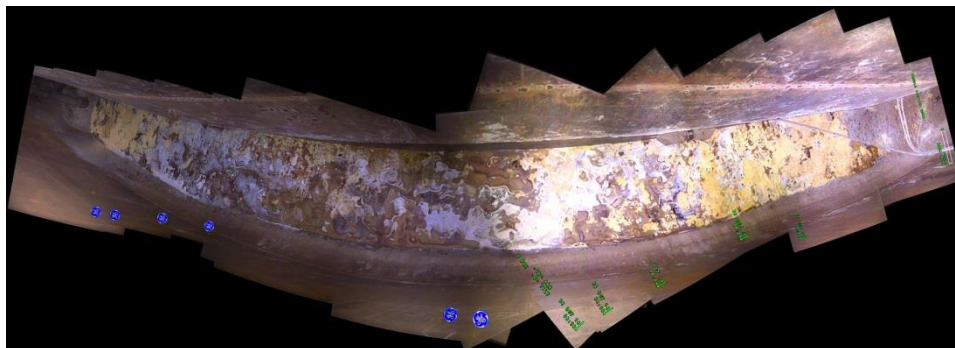


Slucier #2 Under Riser #2

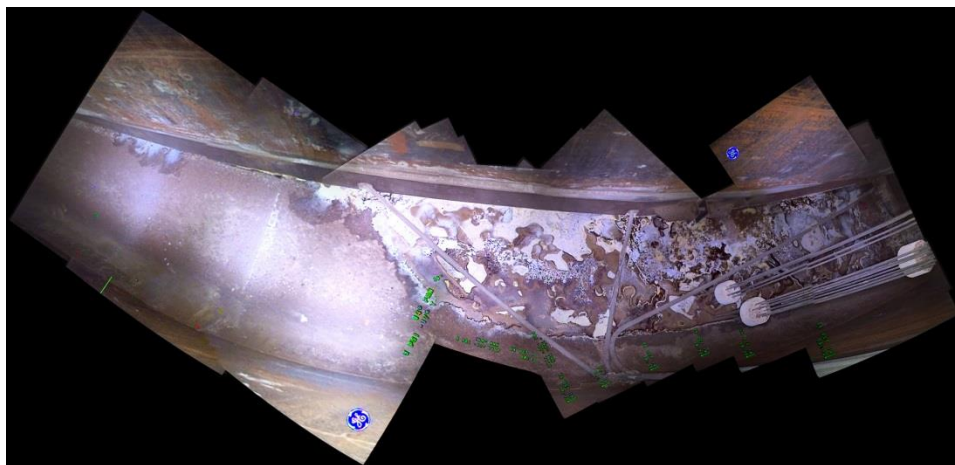




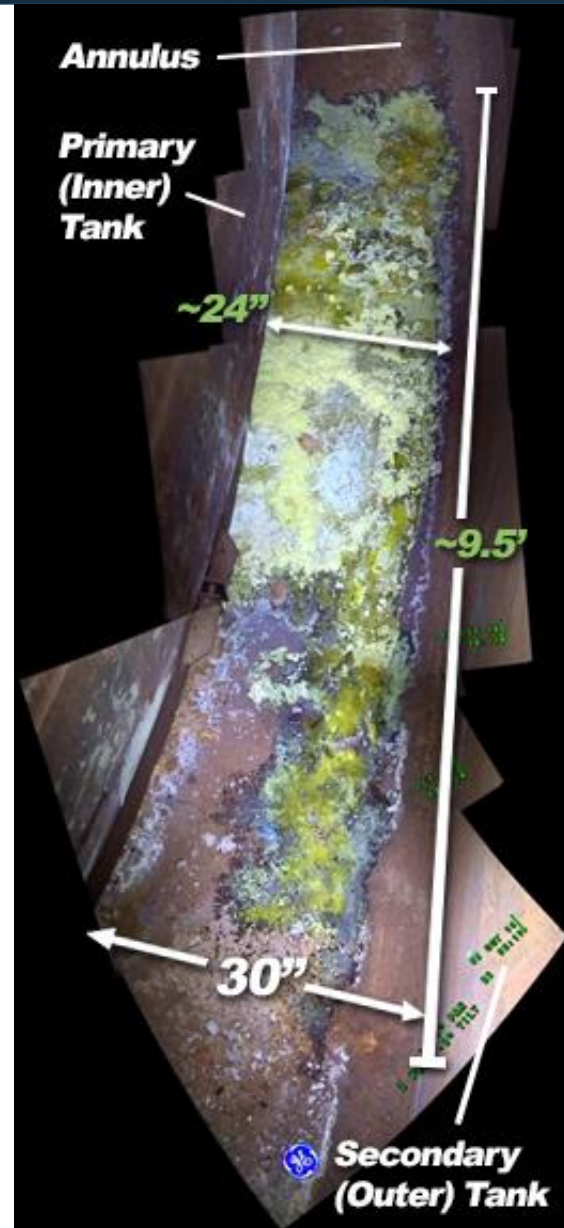
# Status on Double-Shell Tank AY-102



Riser 87



Riser 77



Riser 83





# Settlement on Double-Shell Tank AY-102







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# Waste Treatment and Immobilization Plant Update

High-Level  
Waste Facility

Pretreatment  
Facility

Analytical  
Laboratory

Balance of Facilities  
(20 support buildings)

Low-Activity  
Waste Facility

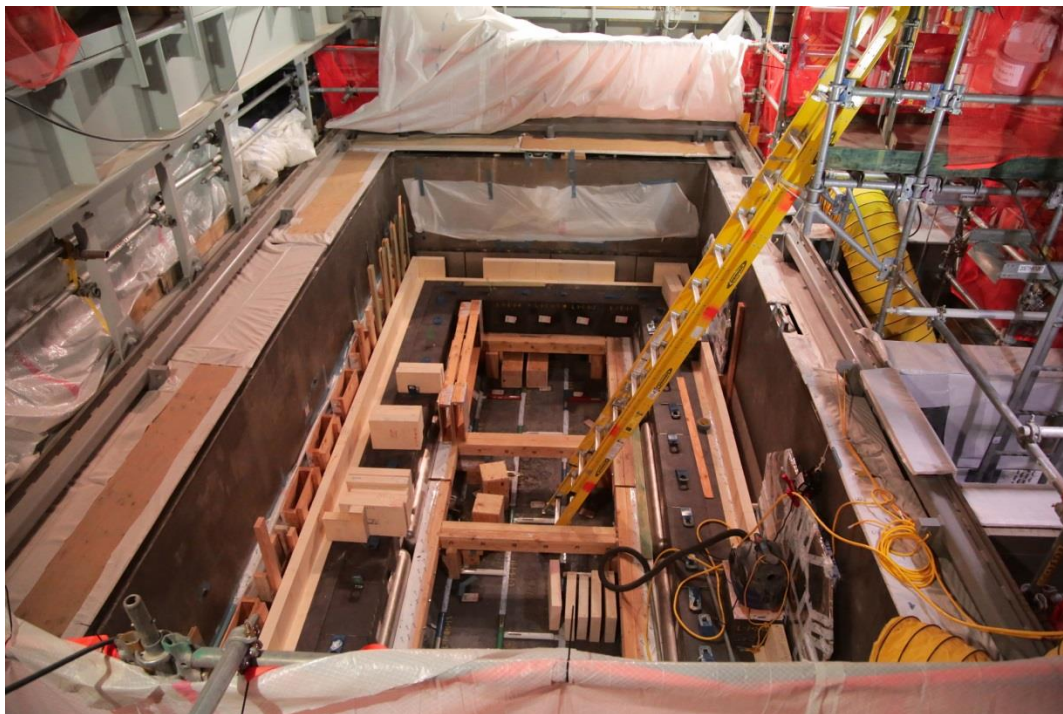
September 10, 2013





# Low-Activity Waste Facility

Continuing work in the LAW melter –  
refractory brick and trough and dam  
installation







# Analytical Laboratory



Exterior



Fume hoods



Air-handling systems





## Balance of Facilities – Supports Operations



20 support buildings for the Balance of Facilities



Glass former piping



Overhead pipe racks for steam and glass former materials

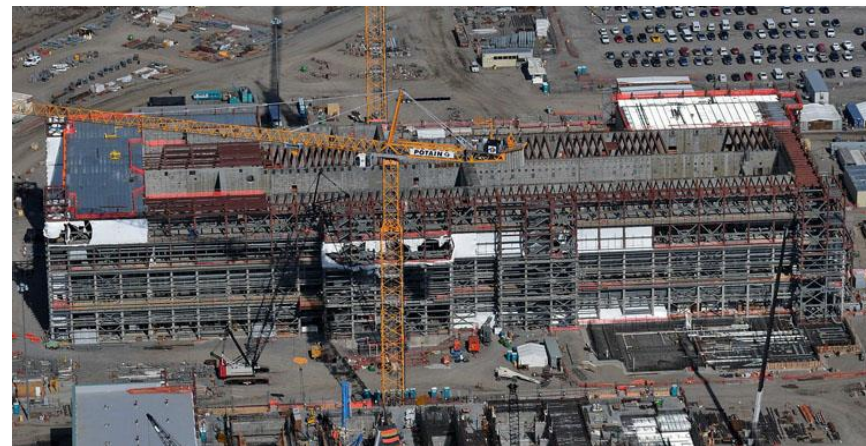
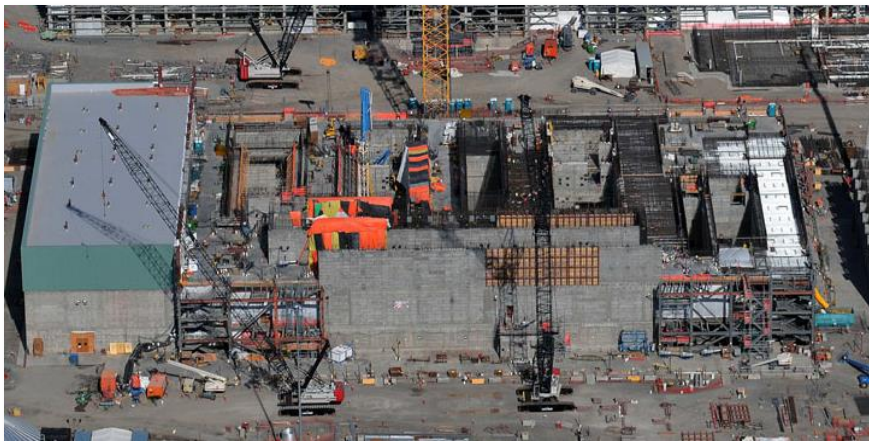


Glass former silos

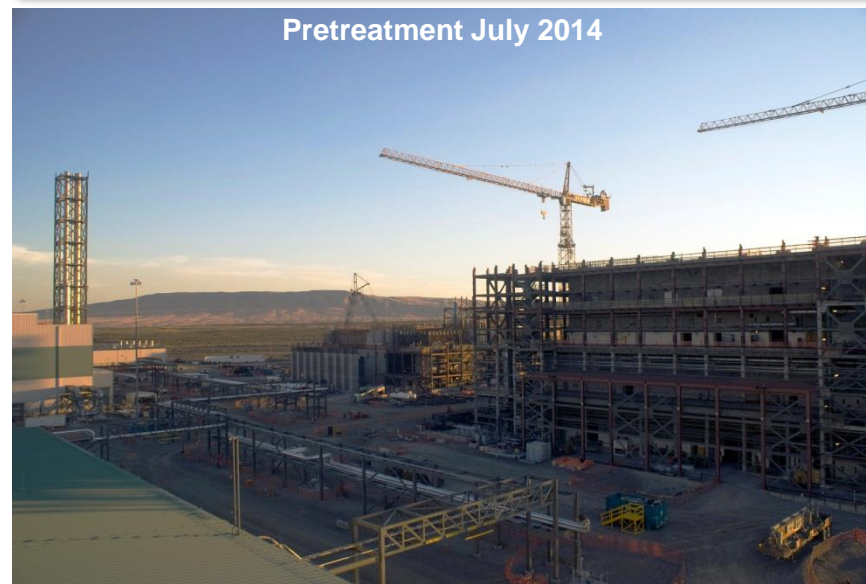




# High-Level Waste and Pretreatment Facilities



High-Level Waste July 2014



Pretreatment July 2014





## Selected Topics Specifically for the Hanford Advisory Board





# Focus for Fiscal Year 2015

- Continuing C Farm retrieval to completion
- Preparing for next 10 tanks – A/AX Farms
- Double-shell tank space management – 242-A Evaporator campaigns
- Vapor Implementation Plan
- Full Production Engineering
- Direct Feed Low-Activity Waste
- Low-Activity Waste Pretreatment System
- Full Scale Vessel Testing
- High-Level Waste to Full Construction





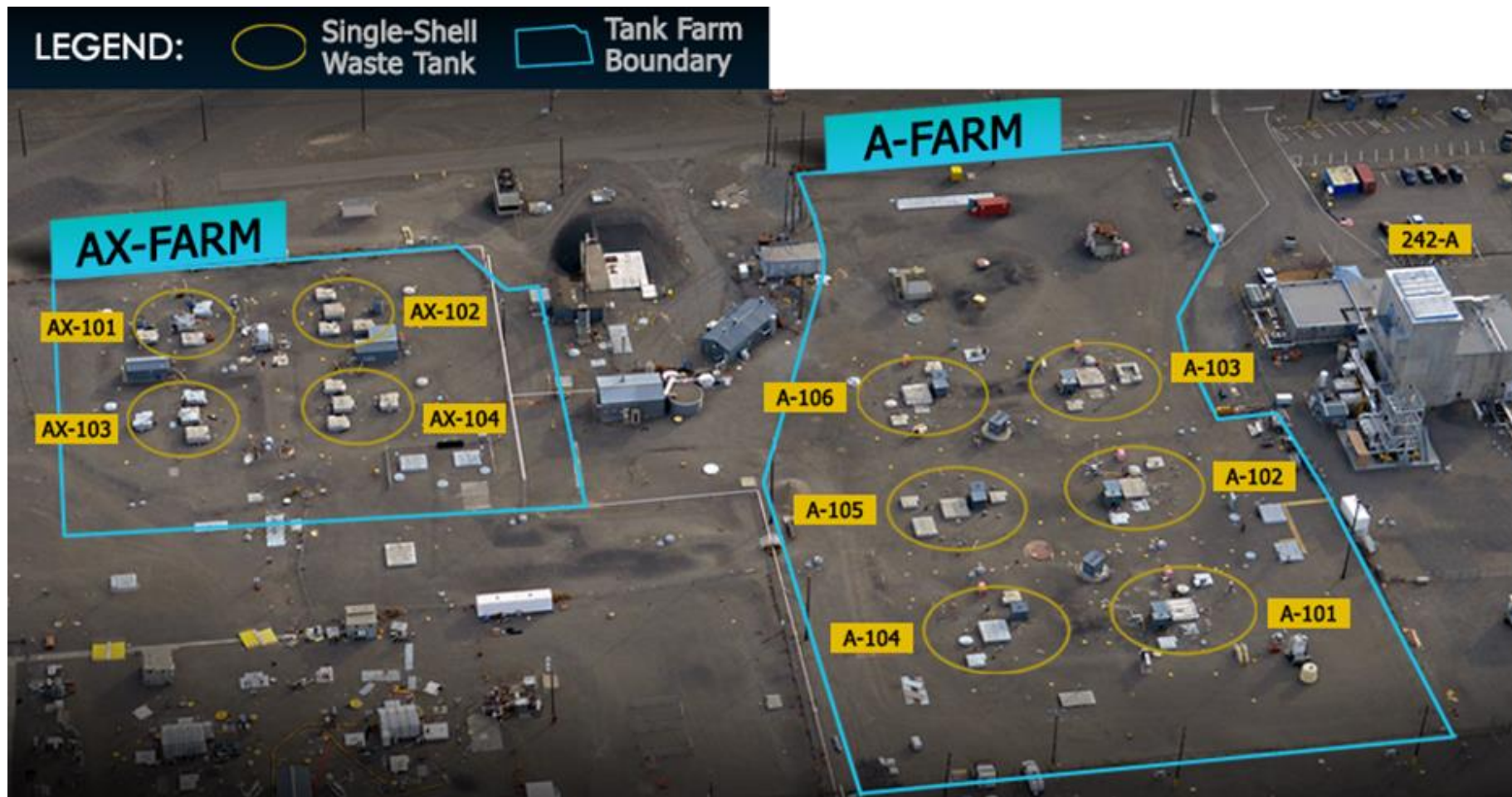
# C Farm Retrievals







# Preparing Next Single-Shell Tank Retrievals





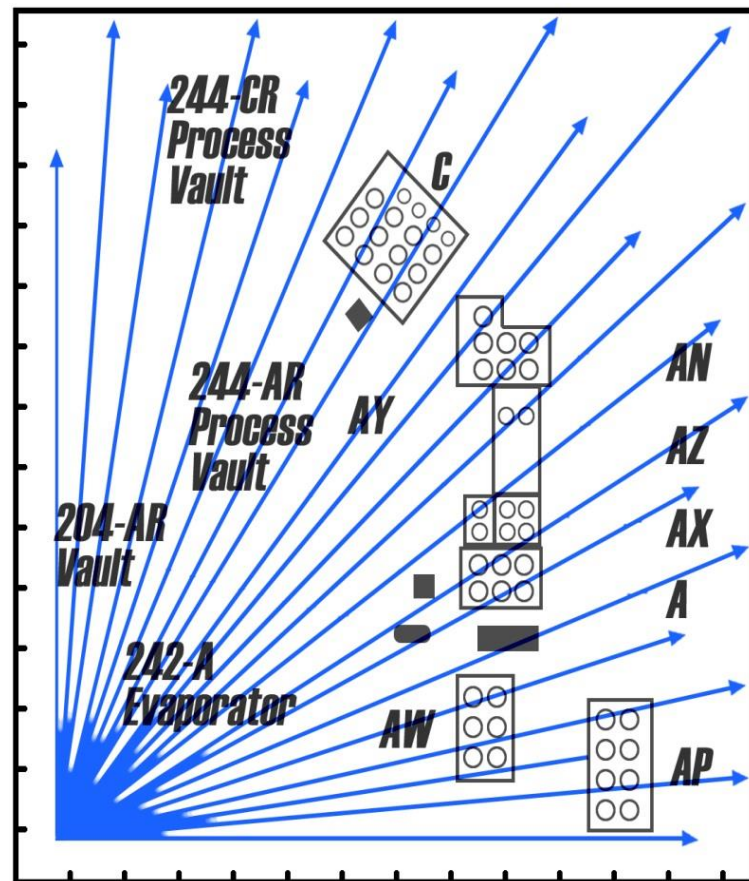
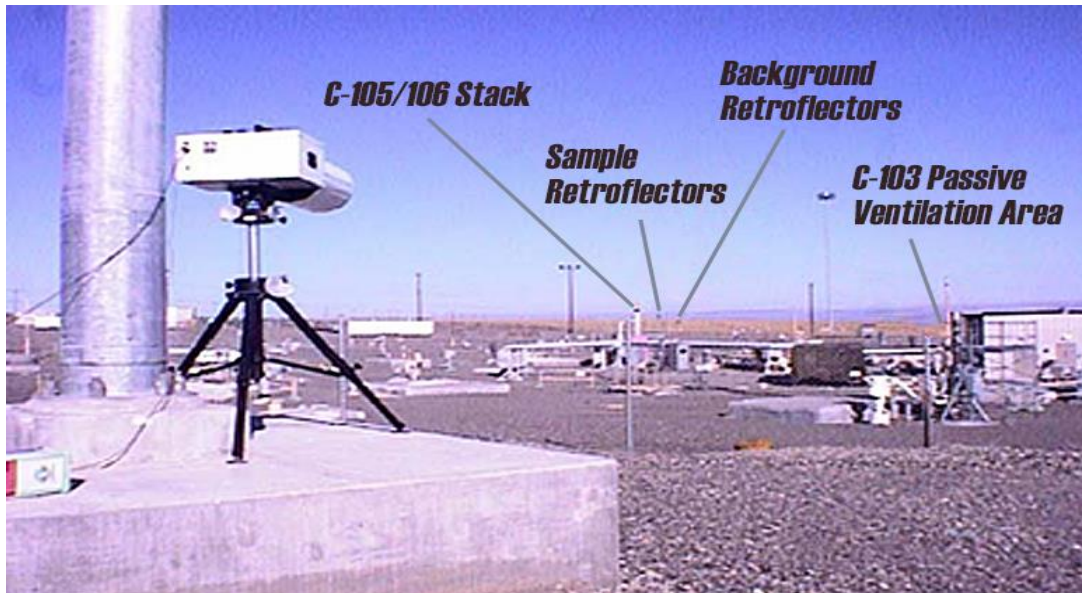


*242-A Evaporator*





# Vapor Implementation Plan







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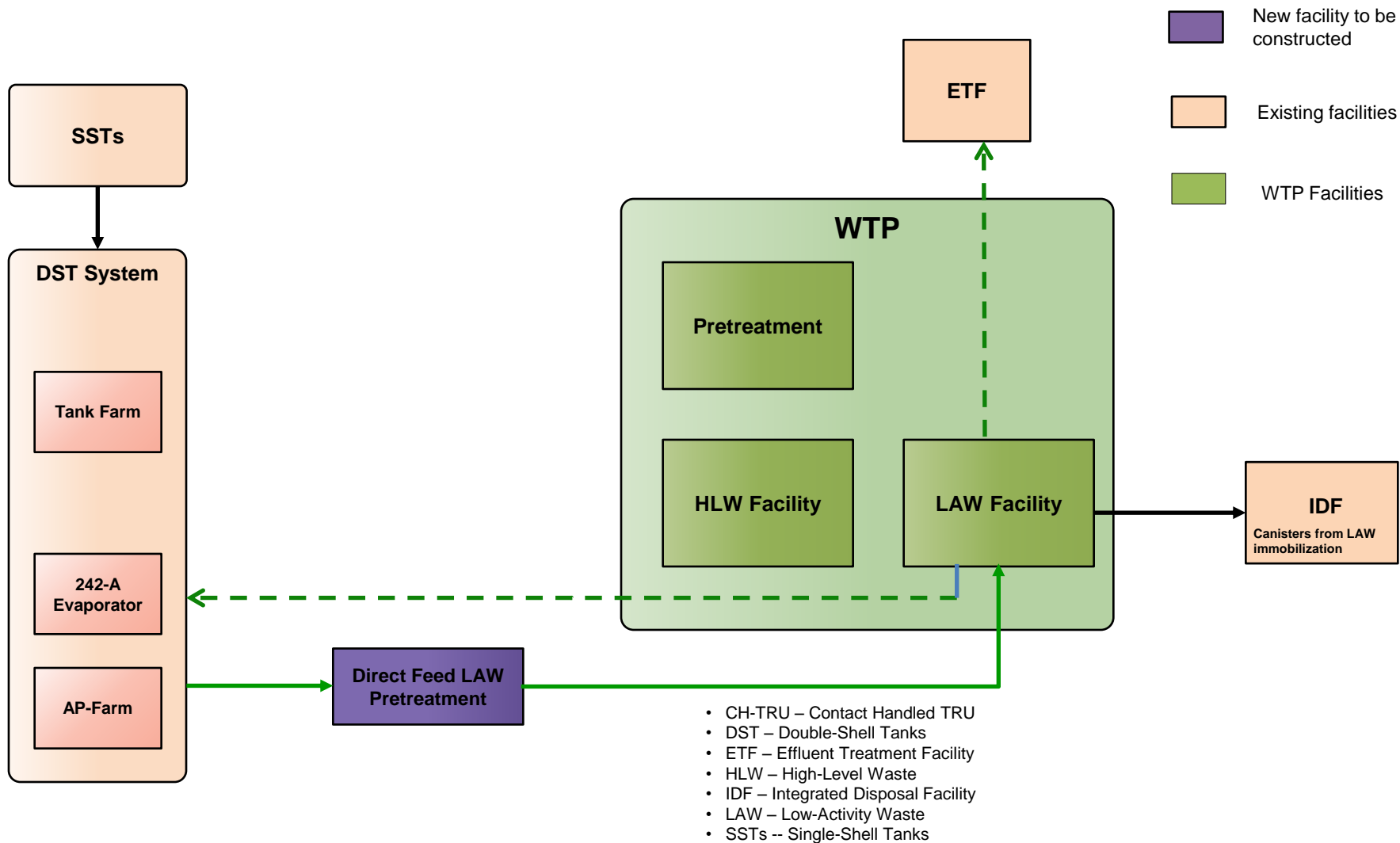
# Full Production Engineering







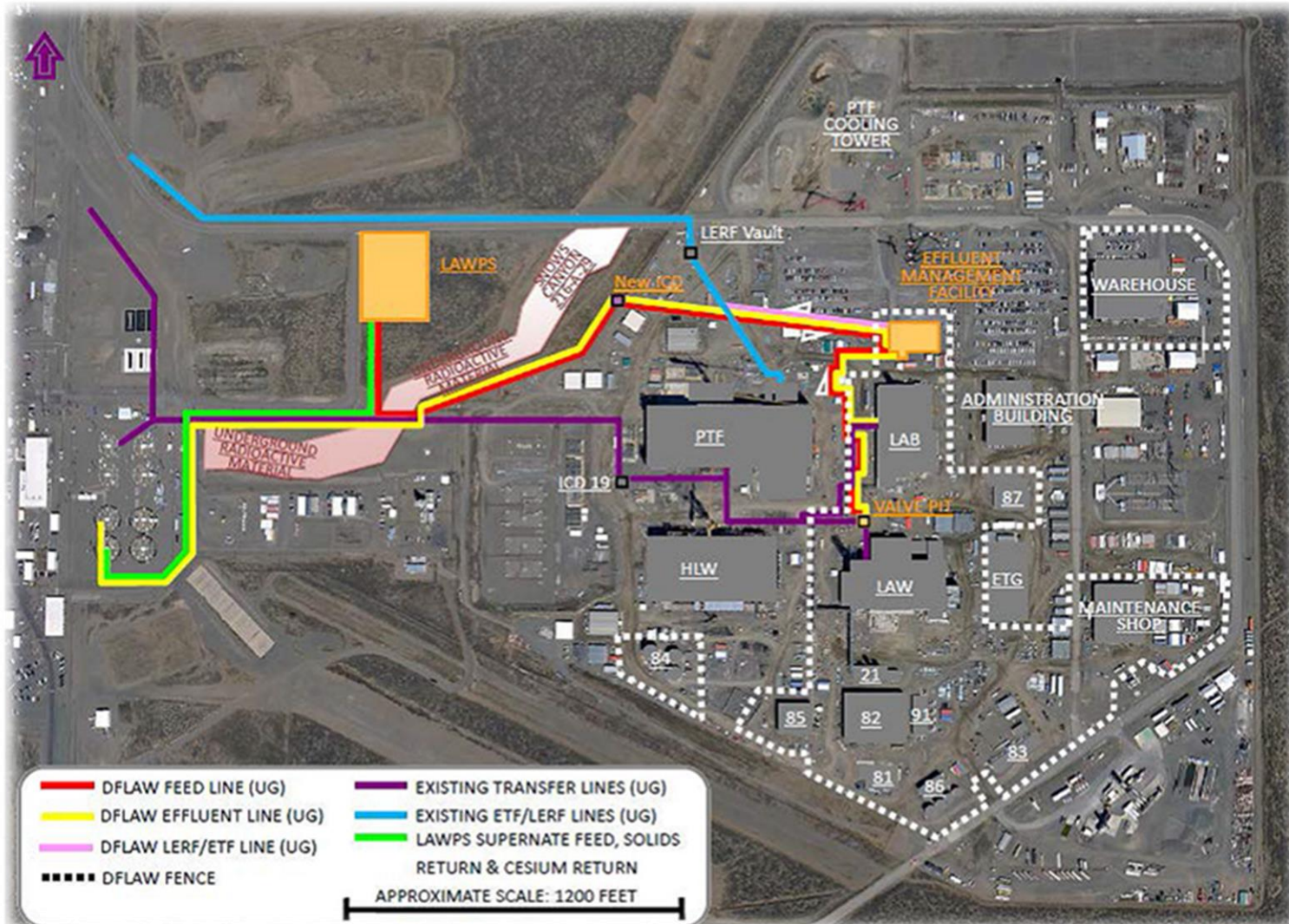
# Direct Feed Low-Activity Waste







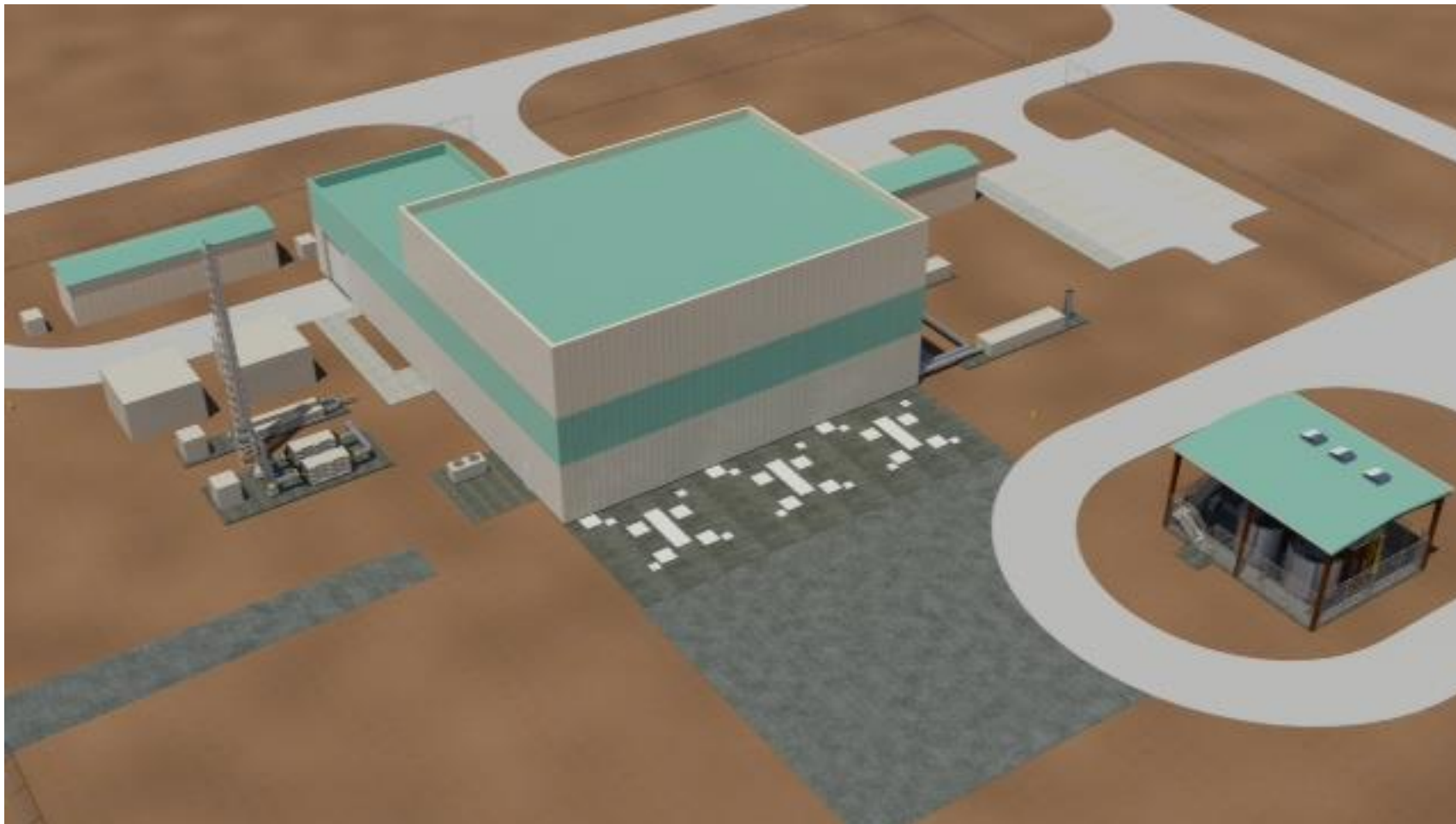
# Direct Feed Low-Activity Waste







# Low-Activity Waste Pretreatment System



Artist's Rendition of Finished Facility





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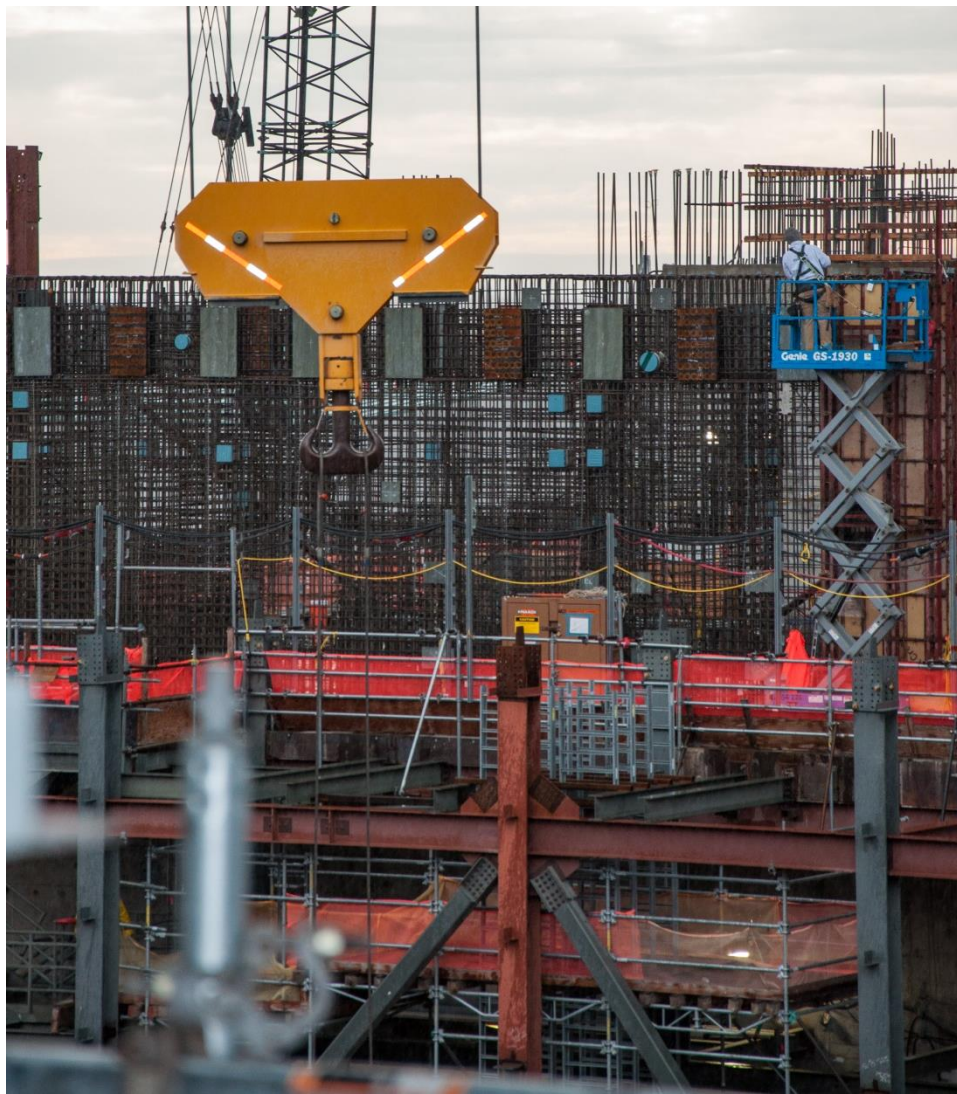
# Full-Scale Vessel Test Facility







# High-Level Waste Facility – Authorization to Proceed

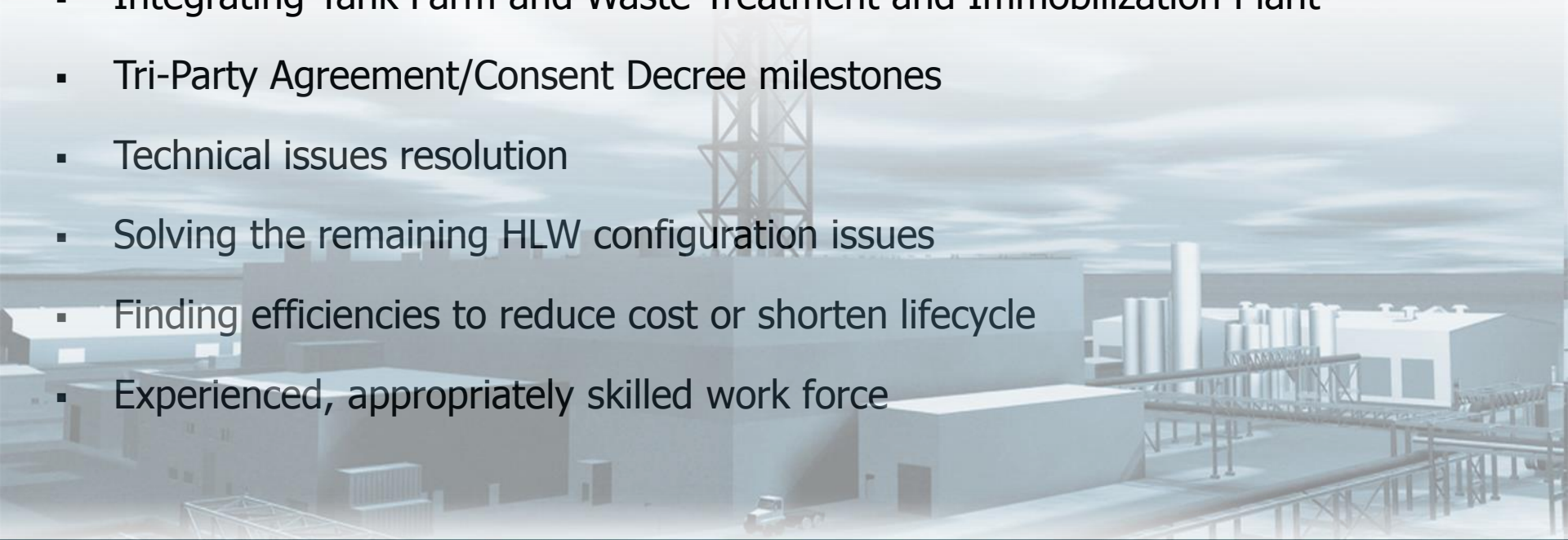






# Office of River Protection's Top 10 Challenges

- Aging tank farm infrastructure
- Implement Fixes for Tank Farm Vapors
- Out-year funding profiles
- Quality standards and records for nuclear operations
- Integrating Tank Farm and Waste Treatment and Immobilization Plant
- Tri-Party Agreement/Consent Decree milestones
- Technical issues resolution
- Solving the remaining HLW configuration issues
- Finding efficiencies to reduce cost or shorten lifecycle
- Experienced, appropriately skilled work force







# Protect the Public, the Environment, and Our Workers

## Safety Always Comes First

White Bluffs overlooking the Columbia River on the Hanford Reach





# Back-Up Slides





## 242-A Evaporator Campaign

- First campaigns in nearly four years
- Reduced volume by 750,000 gallons in first phase of campaign
- Expect to create an additional 400,000 gallons of storage space in the second phase of the campaign
- Major operational and safety upgrades



242-A Evaporator





# Safely Managing Tank Farm Hazards

- Hanford's tank farms are a hazardous work space
- Workers deal with radiological, industrial, and chemical hazards on a daily basis
- Hazards are identified, controlled, and minimized
- Many improvements have been made in the past 10 years
- Continue to look for ways to safely reduce exposures







# Respiratory Protection Requirements







# Current Actions to Control Chemical Vapors

- Eliminate Vapor Sources
- Engineered Controls
- Administrative Controls
- Personal Protective Equipment







# Near-Term Technology Demonstrations

## Area Detector (FLIR Camera)

- Passive infrared (IR) imager
- Detects volatile organic compounds (VOC)
- Commercial hand-held (real-time)
- Visualize absorptive and emissive properties of vapors
- Used in gas/space industry







# Independent Expert Assessment

- Savannah River National Laboratory lead an expert panel review of current chemical vapors management and worker protection measures
- Experts from academia, industry, professional societies, and government agencies
- Experienced in toxicology, exposure assessment, industrial hygiene engineering, program management, and chemistry and respiratory protection
- Not just a review; focused on solutions



Eliminate Vapor Sources



Remote tracking/  
data logging





## HAB Advice from September 2013 – September 2014

Advice #271 – Leaking Tanks – did not accept

Advice #272 – DOE-ORP Budget Requests – partially accepted

Advice #273 – Openness and Transparency Related  
to Tank Waste Treatment (Headquarters response)

Advice #275 – Path Forward on Tank Waste – partially  
accepted

Advice #276 – 2014 Lifecycle Scope, Schedule and  
Cost Report (Lifecycle Report) – did not accept

Advice #277 – 2015 Presidential Budget and 2016  
Budget Request – partially accepted

Advice #279 – Proposed Amendments to the Consent Decree  
from DOE and Ecology – partially accepted

The Department of Energy appreciates  
the HAB's continued interest in the  
cleanup and closure activities at Hanford.